

The Cointegration and Adjustment Speed of Inflation, Output Growth, Volatility of Inflation and Volatility of Output Growth

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Under the economic connection of globalization, the Thai economy has to endure not only the internal circumstances, but also the impact of turmoils in other countries, which can be an external risk factor to its growth. In order to present empirical evidence and help understand the interaction between price levels and economic activities in Thailand, this study investigates their relationship. This should provide agencies involved, both the public and private sectors, fundamental information necessary for the formulation of policies to handle the impact of external phenomena. This information can also be useful for an improvement in resource allocation, people's welfare, and academic knowledge.

This research employs Error Correction Model (ECM) to study the short run equilibratory relationship between inflation rate and economic growth rate. At the same time, the long term relationship and impulse response among economic growth rate, inflation rate, the economic growth uncertainty, and the inflation uncertainty are also investigated. In order to measure the economic growth and inflation uncertainty, the Ordinary Least Square (OLS) and ARCH-type Models are employed. The study focuses on the period between the first quarter of 2001 and the first quarter of 2014 because this is a period when the ramification of the 1997 economic crisis has lessened as well as the Bank of Thailand has pursued the policies of

inflation targeting and managed-float exchange rate. In addition, during that period, Thailand has faced with economic difficulties due to the rise in oil prices, uncertainties from world financial and economic crises. All these incidents brought about the volatility of economic growth and inflation.

The results on the test of the long term equilibratory relationship between the values of GDP (LGDP) and general price levels (LCPI) show that these 2 time series data have an symmetric cointegration property. Therefore, the ECM model, which has been used for the short run relationship test, is then associated with symmetric error correction model. An estimated ECM indicates that AR(|2,3|) and AR(1,|3|)-ARCH(1) are most proper to estimate the economic growth rate (GGDP) and inflation rate (INF), respectively. The estimations of coefficients for Error Correction Term (ECT) of both equations present the statistically and significantly negative relationship at a conventional confidence level. This shows that a speed of adjustment towards a long term equilibrium or the size of standard deviation from equilibrium could be eliminated in the next quarter. When comparing the size of coefficients, it can be seen that the speed of adjustment of LGDP is faster than that of LCPI. Furthermore, ECM's results reveal short-run effects among independent variables.

To test of the long term equilibratory relationship and examine the size of adjustment for deviation from equilibrium in the case of an immediate change of 1 unit among economic growth rate, inflation rate, the volatility of growth rate, and the volatility of inflation rate, this study applies VAR-based Impulse Response Test. The volatility of economic growth rate (GUN) and the volatility of inflation rate (UINF) are measured by residuals from OLS and AR(1)-ARCH(1) estimation, respectively. To sum up, the estimation on the relationship among variables by VAR model indicates that some endogenous variables do not show the long term relationship

with dependent variables, especially the volatility of economic growth rate, which insignificantly relates to other variables. On the contrary, economic growth rate can significantly affect the adjustment process in most cases. This reflects the fact that economic growth rate represents all economic activities taking place in the country and their influences on price levels, thereby people's welfare.

The estimation on the size of response of inflation rate and the volatility of inflation rate shows that both variables can respond to their immediate self-changes too. However, in the long run, all variables adjust to its equilibrium after surged by any sudden incident. The adjustment process of inflation rate and the volatility of economic growth rate to sudden changes in economic growth rate is slower than other cases. It should be noted that economic growth rate, inflation rate, and the volatility of inflation rate negatively respond to disturbances in the volatility of economic growth rate.

This research's results present implications for the implementation of macroeconomic policy to maintain continuous economic growth as well as better standards of living and welfare. The findings provide important insightful information for government agencies involving in formulating policies. For example, GGDP reflects economic activities, consequently, price stability and economic growth. Thus, maintaining continuous economic activities can sustain or improve people's welfare and inflation cost. At the same time, agencies involved can also adjust the forecast of output more effectively than price level. This can be done because of the availability of more accurate and efficient information about economic activities than price level. The economic growth is more likely manageable than inflation rate. Moreover, changes in price levels have long-run relationship more with narrow money supply than GDP and

interest rate. All 4 variables can eventually adjust towards long term equilibrium when there are disturbances occurred.

As for future researches, such issues as oil or other alternative energy prices should be included in the analysis of long-run relationship with economic growth rate and inflation rate as well as the response to sudden changes in oil or other alternative energy prices. Information derived from the study should benefit the public sector in executing macroeconomic policies. As for the private sector, it should provide a guideline for the forecast and determination of business strategy. Also, it adds up to the body of knowledge in related fields.